THE

December, 1960

CHEMIST

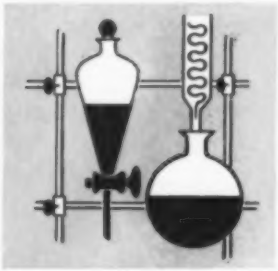
VOLUME XXXVII

NUMBER 12

Dr. Roger W. Truesdail, F.A.I.C.
Receives Honor Scroll of Western Chapter

(*See page* 439)

NOW! 87 IMPORTANT ORGANIC SOLVENTS and LIQUID ORGANIC CHEMICALS



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Chlorobenzene, Reagent	Propionic Acid, Reagent

iso-Propyl Acetate, Reagent

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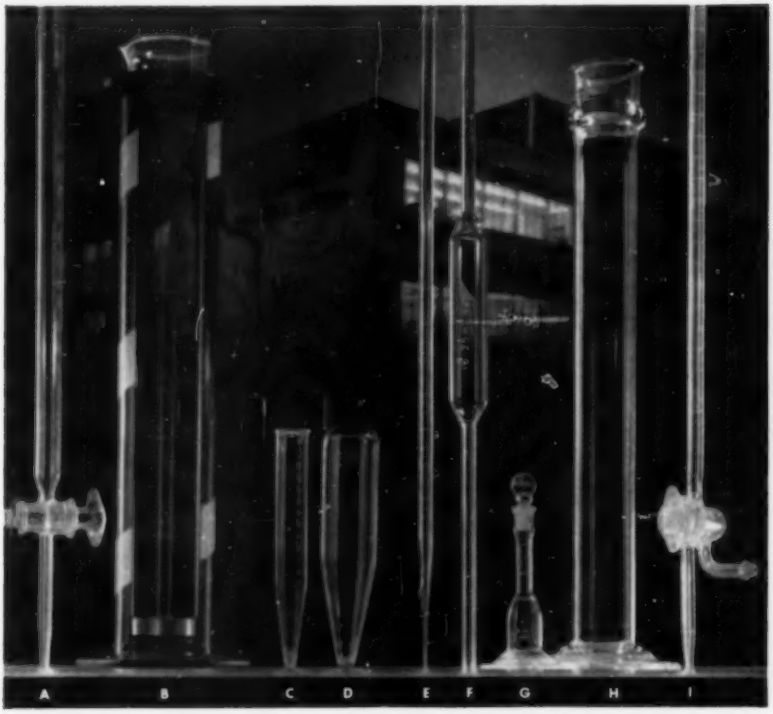
Phillipsburg, New Jersey



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CYLINDERS. 3025(B) has a steel carrying case to protect glass and contents during trips around the plant. Great for sampling and the like. The reinforcing bead on the 3046(H) is one reason this model outlasts ordinary cylinders 3:1.

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PIPETS. 7101(F) has rugged construction, just like our regular 7100 transfer pipet series. Difference: tip opening is extra large for faster work with viscous liquids. The measuring pipet (Mohr) (E) with the extra-long tip is 7064. Works fine with narrow neck flasks and tubes.

FLASKS. Micro-volumetric 5630(G) has hexagonal base. Very stable. Class A capacity tolerances, ℞ stoppers, sizes 1 thru 5 ml.

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Publication of

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Vol. XXXVII December, 1960 Number 12

Merry Christmas

IN THIS ISSUE

To Come in January

At the New Year, it is customary to prophesy the future. M. H. Baker, of M. H. Baker Co., Minneapolis, Minn., will do this for us in a paper entitled, "Industrial Chemistry 1935-1985." • The White House Conference on Aging will be held in Washington, D.C., Jan. 9-12. Our president-elect, Dr. Johan Bjorksten, plans to review the "background paper" given out on it. Bernard Schaar, F.A.I.C., has been appointed as a delegate from the State of Illinois to this Conference. • Short articles will include, "Science is the Essence of Today's Culture," "For the Cause of World Peace," "How Small Chemical Businesses Can Reduce Taxes . . .", and other material.

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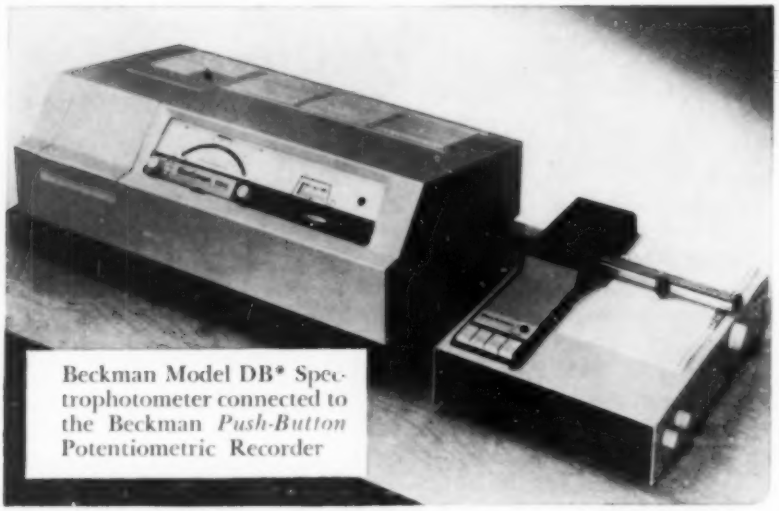

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EDITORIAL

Professional Standing is Also an Attitude of Mind

Raymond C. Crippen, F.A.I.C.

Chairman, Baltimore AIC Chapter, and director, Crippen Laboratories Division of Foster D. Snell, Inc., Baltimore 2, Maryland.

IN employing young chemists and even older ones, it is sometimes our task to instill in them a "professional attitude." Sometimes these young people do or say something that we do not feel reflects the best attitude becoming to a professional chemist. It is amazing how their attitudes can improve when they are reminded that they are professional chemists of stature similar to physicians and lawyers. If one points out that certain things are expected of professional chemists and that their present attitudes, actions, and thoughts do not contribute to the best of the profession, they are bound to improve.

This was tried on a young male chemist who had said things to one of our female chemists that could not be considered proper. The young chemist was called into my office and his behavior was brought to his attention. He was reminded that he was considered a professional man, but that his action toward one of his fellow workers was incompatible with a man of professional stature. This happened over two years ago and we have not had any trouble with him since that one time.

We of the Baltimore Chapter think that many younger chemists should be invited into THE AMERICAN INSTITUTE OF CHEMISTS, not as full Fellows until they have proven themselves, but as Associates. It is only by taking the young chemists and training them in professional attitudes that we are going to continue to advance our profession.

What is $100 Worth Today?

EACH year student medalists of the AIC are invited to participate in our Student Medalist Essay Contest, which closes in September of the year in which the student receives the medal. Last year, we received but one manuscript, not carefully prepared nor well-organized enough to meet the minimum standard of acceptability. This year no one at all submitted a manuscript. In contrast, the preceding two years of the contest were successful—a number of high-quality manuscripts were

received, and two students received $100 each.

Making allowances for the fact that the dollar suffers from depreciated value, we still cannot understand why today's students should conclude that the pleasant exercise of writing 2000 words on "Chemistry (or Chemical Engineering) as a Profession" is too much effort to expend for a possible $100.

Special AIC Announcements

Piedmont Chapter Elects New Officers

The Piedmont Chapter elected the following officers at its Annual Charter Day Banquet, October 6:

Chairman, Dr. Ivy M. Parker, Plantation Pipe Line Co., P.O. Box 1743, Atlanta 1, Ga.
Chairman-elect, A. B. Allen, Coca-Cola Export Corporation, P.O. Drawer 1734, Atlanta, Ga.
Secretary-Treasurer, Prof. W. I. Wynn, Emory University, Atlanta, Ga.
National Council Representative, Dan L. Henry, Law & Company, P.O. Box 1558, Atlanta, Ga.
Committee Chairmen:
Program, J. F. Collins, Jr.
Membership, Everett S. Hopper
Welcoming, Charles E. Waites
Government Legal, C. Gortatowsky
Publicity, A. J. Shingler
Nominating, Frank Melcher

Committee on New Chapters and Expansion

Martin Williams, chairman of the Committee on New Chapters and Expansion, announces that the following members are serving on this committee:

Clark E. Thorp, *Eastern Vice Chairman,* Beaver Falls, N. Y.
Dr. Rudolph Seiden, *Midwestern Vice Chairman,* Kansas City, Missouri.
David H. Killeffer, *Southern Vice Chairman,* Clearwater, Florida.
Dr. Lloyd Van Doren, *Western Vice-Chairman,* Tempe, Arizona.
Robert E. Lacey, *Secretary,* Birmingham, Alabama.
Dr. Morris J. Blish, Phoenix, Arizona
The Rev. Paul J. Casey, S.J., Scranton, Pa.
Stanley W. Comer, Ogden, Utah
Dr. J. Edward Doody, F.S.C., Memphis, Tenn.
Arthur D. Etienne, Washington, D.C.
Dr. Robert W. Freedman, Pittsburgh, Pa.
Edward L. Gutberlet, Seattle, Washington
Dr. W. A. Hammond, Xenia, Ohio
James E. Henning, Madison, Wisconsin
Paul H. Horton, Dallas, Texas
Dr. A. Edward A. Hudson, Jackson, Tenn.
Dr. Robert H. King, Dugway, Utah
Dr. Wilbur A. Lazier, Williamstown, Mass.
Charles R. Outterson, Richmond, Va.
Dr. L. F. Pierce, Los Angeles, Calif.
Karl A. Ratcliff, Des Moines, Iowa
Dr. Gus A. Ropp, Oak Ridge, Tenn.
Dr. Robert D. Schwartz, Houston, Texas
Henry G. Sellers, Jr., Pensacola, Florida
Dr. Stanley C. Spalding, Jr., Louisville, Ky.
James W. Stallings, Barnwell, S.C.
Dr. Frank J. Steele, Greenwich, Conn.
Dr. Sumner B. Twiss, Trenton, Mich.
Dr. J. A. Weybrew, Raleigh, N. C.
Dr. John W. Willard, Rapid City, So. Dakota

Midwest Chapter Elects Vice Chairman

Last summer, Dr. A. Ernest MacGee, vice chairman of the Midwest Chapter, became chairman following the death of Dr. Vanston H. Ryan who formerly held that office. Earl D. Johnson, at an Executive Committee Meeting held in October at the home of Dr. Rudolph Seiden, was elected vice chairman to fill Dr. MacGee's former position. The Chapter's officers now are:

Chairman, Dr. A. Ernest MacGee, Skelly Oil Co., P.O. Box 436, Kansas City 41, Mo.

Vice chairman, Earl D. Johnson, 2409 W. 47th Terrace, Kansas City 3, Kansas.

Secretary, Raymond S. Dalter, Spencer Chemical Co., Research Center, 9009 West 67th St., Merriam, Kansas.

Treasurer, Raymond H. Frederick, Reynolds Metals Co., 4900 Oak St., Kansas City, Mo.

National Council Representative, Bernard Weiner, Vet Products Co., 1524 Holmes St., Kansas City 8, Mo.

The Second Joint Automatic Control Conference will be held on the University of Colorado campus, Boulder, Colo., June 28-30, 1961. It is sponsored jointly by ISA, AIChE, AIEE, ASME, and IRE.

Good-will is Built by Little Deeds

Sound and successful . . . public relations do not spring up overnight, but rather evolve from an accumulation of the little things we do for one another and for the public day by day.

—W. G. Vollmer

Family Doctor Week

The Hon. Abraham A. Ribicoff, governor of Connecticut, proclaimed Oct. 16-22 as official "Family Doctor Week" in that state. It is not inconceivable that a "Scientists' Week" might appeal both to the public and to those who lead the trend toward new things.

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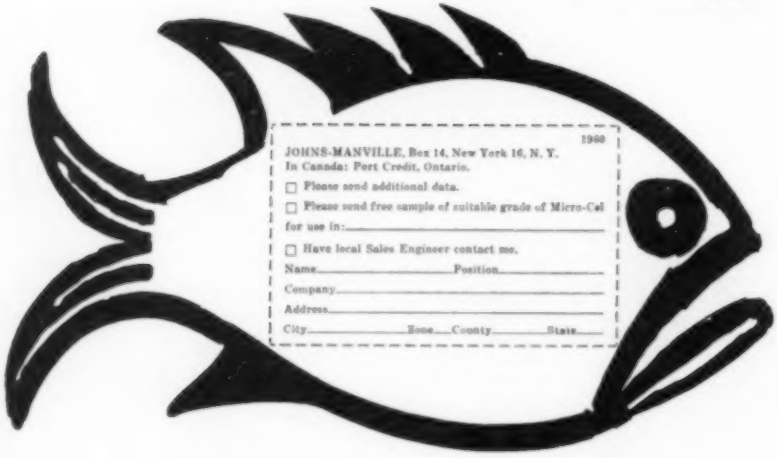

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Science and Religion

Dr. Stewart J. Lloyd (1881-1959)

(A condensation of a talk presented when the late Dr. Lloyd, a Charter Member of the AIC, received the Herty Medal.)

MY subject is simply Science and Religion, without specifying any particular kind of religion. The students in our colleges today are anxious to reconcile the essentials of the religion of their fathers with the startling growth of our knowledge of the material world—our science.

By science I mean the "natural sciences," physics, biology, chemistry, astronomy, geology, experimental psychology. By religion I mean the belief in an intelligence surpassing that of man, an intelligence essentially benevolent, and the existence of a definite program and purpose and meaning in human life.

Man's ethical, moral, artistic, and literary growth came quite early, and I question whether he has made any real advances in these fields during the past 2500 or 3000 years. In *Dawn of Conscience*, Dr. Breasted, famous Egyptologist, traces throughout Egyptian history the growth of the idea of moral responsibility, but as far back as he can go he finds the moral law still present.

The first principle of every worker in the natural sciences is to look for and to respect facts. What are the facts today, as of old, about man's relation to a superior intelligence with superior powers?

First there is no record of any tribe or race, however low in the scale of civilization, which is entirely without the idea of a higher and supreme being of some kind. This is as definite a fact as that sugar will dissolve in water. It is one of the basic things about man. The higher in the scale of civilization, the more refined, the less anthropomorphic and coarse is this idea.

There is another fact, as universal in man as the first, but developed to different degrees in different races and in different individuals, the existence of what we call the "moral law," the recognition of right and wrong. Where did it come from, this instinctive knowledge that certain actions are good, others bad?

> For not of today, nor yesterday are these,
> But live forever, and no man knoweth whence they come.
>
> —*Sophocles*

We must cite still another basic peculiarity of man. Some idea of a future life, shadowy and dim in many, sharp and well-defined in others, exists in all races, even the lowest type of humanity. Where does it come from? Nobody knows, but it is there, implanted apparently from the beginning.

And still a fourth fact, the most important, as well established as any of the experimental facts of chemistry, is that people at all times and in all lands, whose lives have been

guided by what we usually call the principles of religion, the moral law, have lived, generally speaking, more satisfactory lives than those who do not observe it. The word "satisfactory" is not a good one, but the best one I could find.

On the other hand, compared with the permanent nature of these four items, the whole tendency of scientific discovery has been to emphasize the provisional, the temporary nature of its conclusions and inferences. Experimental facts still remain facts, they are eternal, but the mode of grouping these facts, and the theories that connect and classify them have changed frequently and will continue to change. I do not, however, foresee any changes in the four supports mentioned for religion; the instinctive belief in higher intelligence, the recognition of the moral law, the belief in a future life, and the effect of a religious attitude on conduct, on satisfactory living.

Many people are troubled because the statements made in religious books used as a basis for religious faiths—the Bible, the Koran, the Hindu Scriptures—about the origin and age of the earth do not seem to agree with the evidence supplied by geology and related sciences. This has never seemed to me to be a matter of consequence. The value of all such books is in their moral content. They are not historical manuals; they are certainly not textbooks of geology or palaeontology or physics. It is no reflection on their authors that they believed the world to be only a few thousand years old and that the sun moved around the earth. If we concentrate upon the moral values of these ancient books instead of seeking discrepancies in non-relevant things, we shall be better off.

I believe the impact of the sciences upon religion will be largely to promote a greater tolerance, a greater respect for differing religious opinion. "What doth the Lord require of thee," asks Micah, "but to do justly, to love mercy, and to walk humbly with thy God?"

Here is a quotation from one of the two or three great physicists of the last hundred years, Max Planck:

> There can never be any real opposition between religion and science; for the one is the complement of the other. Every serious and reflective person realizes, I think, that the religious element in his nature must be recognized and cultivated if all the powers of the human soul are to act together in perfect balance and harmony. And indeed it was not by accident that the greatest thinkers of all ages were also deeply religious souls, even though they made no public show of their religious feelings.
>
> It is from the co-operation of the understanding with the will that the finest fruit of philosophy has arisen, namely, the ethical fruit. Science enhances the moral values of life, because it furthers a love of truth and reverence—love of truth displaying itself in the constant endeavour to arrive at more exact knowledge of the world of mind and matter around us, and reverence, because every advance in knowledge brings us face to face with the mystery of our own being.

Student Medalists of 1960

(Student Medals are awarded on the basis of leadership ability, character, and high scholastic standing.)

STUDENT MEDALIST	COLLEGE	AIC CHAPTER WHICH MADE THE AWARD
Adamovich, Radmila	Western College for Women	Ohio
Ake, Robert L.	University of Indiana	Chicago
Ames, Lynford	Muskingum College	Ohio
Anderson, Richard D.	Northeastern University	New England
Arnold, Frances	College of St. Mary of the Springs	Ohio
Baker, Frank W.	The College of Wooster	Ohio
Birman, Sylvia	Syracuse University	Beaver Falls
Black, Billy C.	George Washington Carver Foundation	Alabama
Blount, Jack	Antioch College	Ohio
Booher, Theodore	Howard College	Alabama
Bottger, Gary L.	University of Southern California	Western
Brackenridge, David	Canisius College	Niagara
Braun, Janice	University of Colorado	Midwest
Broch, Virginia	University of Vermont	New England
Brueckner, David	Ohio University	Ohio
Budz, Joan Ann M.	Douglas College	New Jersey
Buffaloe, Jacquelin F.	Florence State College	Alabama
Calder, George V.	University of Notre Dame	Chicago
Camp, Joseph S.	Villanova University	Philadelphia
Carter, Charles C.	Pomona College	Western
Coburn, Robert A.	University of Akron	Ohio
Code, Anne	Denison University	Ohio
Condrate, Robert A.	Worcester Polytechnic Institute	New England
Conlin, Mary Agnes	Tufts University	New England
Cosimi, A. Benedict	Regis College	Midwest
Coulter, Paul D.	University of Dayton	Ohio
Cowherd, Chatten, Jr.	Rockhurst College	Midwest
Craig, Joyce	University of Massachusetts	New England
Cronin, Timothy H.	Boston College	New England
Daly, William	Baldwin-Wallace College	Ohio
Darlak, Robert S.	University of Mississippi	Louisiana
Davis, Carolyn	Monmouth College	Chicago
Dessau, Ralph	Columbia University	New York
Dickson, Thomas R.	Whittier College	Western
Dietz, Russell N.	Polytechnic Institute of Brooklyn	New York
D'Iorio, Barbara	Chestnut Hill College	Philadelphia
Doehrman, Evelyn	Purdue University	Chicago
Doyle, Thomas D.	Fordham University	New York
Dunn, Howard E.	Wm. Jewell College	Midwest
Easton, Mrs. Gladys C.	State University of South Dakota	Twin City
Eckert, Charles A.	Massachusetts Institute of Technology	New England
Emptage, Michael R.	Middlebury College	New England
Fearheller, Stephen	Pennsylvania State University	Philadelphia
Foote, Ariel	University of Utah	Western
Fuqua, Beverly Brown	Vanderbilt College	Alabama
Gally, Joseph	Pomona	Western
Getzin, Donald R.	University of Buffalo	Niagara
Gordon, Myra	Mount Holyoke College	New England

STUDENT MEDALIST	COLLEGE	AIC CHAPTER WHICH MADE THE AWARD
Griffel, Jack	Newark College of Engineering	New Jersey
Griffin, Charles C.	Catholic University of America	Washington
Grossman, Stuart	Nebraska Wesleyan University	Midwest
Grove, Andrew S.	City College of New York	New York
Grunewald, Gary L.	Washington State University	Western
Guillory, Jack	Louisiana State University	Louisiana
Habener, Joel	University of Redlands	Western
Harrison, Stanley L.	Drexel Institute of Technology	Philadelphia
Hatcher, Donald W.	Alabama College	Alabama
Hauser, John T.	Villanova University	Philadelphia
Hebert, Leon F.	University of Massachusetts	New England
Hervey, Donald	Hiram College	Ohio
Herz, Jack	City College of New York	New York
Hewett, Gloria J.	University of Missouri	Midwest
Higgs, Mary Ann	University of Alabama	Alabama
Hirsh, Dwight C.	Loyola University of Los Angeles	Western
Hiscocks, Stephen E. R.	American University of Washington	Washington
Hollander, Gary	Polytechnic Institute of Brooklyn	New York
Holton, Sandra	Hamline University	Twin City
Howell, James B.	University of Pennsylvania	Philadelphia
Hull, James G.	University of Virginia	Washington
Huston, Wayne E.	Otterbein College	Ohio
Iacovino, Michael	St. Bonaventure University	Niagara
Immonen, Adele M.	Michigan College of Mining and Technology	Chicago
Innes, John E.	Ursinus College	Philadelphia
Jetter, K. Barbara	Wellesley College	New England
Jones, Marilyn	Lake Erie College	Ohio
Joyce, John F.	Niagara University	Niagara
Kaiser, Edwin M.	Youngstown University	Ohio
Kane, Richard C.	New York University	New York
Kato, Toshio	University of Cincinnati	Ohio
Keedy, Curtis R.	Occidental College	Western
Kelley, Alfred L.	Alabama A & M College	Alabama
Kelley, Philip C.	University of Minnesota	Twin City
Kelly, David J.	Saint Joseph's College	Philadelphia
Kevan, Larry J.	University of Kansas	Midwest
Kopfler, Fred	Southeastern Louisiana College	Louisiana
Kopka, Ernest	De Paul University	Chicago
Kortzeborn, Robert N.	University of Oregon	Western
Krubsack, Arnold	St. Olaf College	Twin City
Landesberg, Joseph	Rutgers University	New Jersey
Laposa, Joseph D.	St. Louis University	Midwest
Lashover, Jacob H.	Tulane University	Louisiana
Leatherman, I. Roger	Kent State University	Ohio
Leininger, Patricia	St. Mary's Dominican College	Louisiana
Linnell, William S.	Carleton College	Twin City
Loring, Richard A.	Worcester Polytechnic Institute	New England
Lowry, Thomas H.	Princeton University	New Jersey
Lyons, Robert W.	Georgetown University	Washington
Martin, Edward S.	De Pauw University	Chicago
Matchett, Mary-Dell	University of Illinois	Chicago
May, Daniel S.	University of Wisconsin	Chicago

The Rev. Homer R. Jolley, S.J., F.A.I.C., of Loyola University, chairman of the awards committee of the Louisiana AIC Chapter, presents student medals to chemistry seniors, Miss Patricia Leininger of St. Mary's Dominican College, and Thomas Ortolano of Loyola Unversity.

McGee, Joyce B.	Iowa State	Midwest
McGrew, LeRoy	Knox College	Chicago
Meinzer, Richard	Drew University	New Jersey
Melton, Sharon L.	University of Arkansas	Louisiana
Meyers, Judith A.	University of Michigan	Chicago
Miller, Kenneth J.	Illinois Institute of Technology	Chicago
Mock, William L.	California Institute of Technology	Western
Moorhead, Elizabeth G.	Bowling Green State University	Ohio
Moss, Robert A.	Brooklyn College	New York
Moynihan, Cornelius T.	University of Santa Clara	Western
Nagel, Ann	Newcomb College	Louisiana
Nagel, Edgar H.	Valparaiso University	Chicago
Nicol, Charles H.	Capital University	Ohio
Niering, Nancy H.	Smith College	New England
Norman, Jack C.	University of New Hampshire	New England
Orloff, Malcolm K.	University of Pennsylvania	Philadelphia
Ortolano, Thomas	Loyola University	Louisiana
Osborne, John P.	Boston University	New England
Pacer, Richard	University of Toledo	Ohio
Pagnucco, Rinaldo	Mount Union College	Ohio
Papsys, Loretta L.	Immaculate Heart College	Western
Pegoraro, Rudolf J.	Columbia University	New York
Phillips, Herman R.	Howard University	Washington
Pickering, Mrs. Janet V.	Heidelberg College	Ohio
Politzer, Peter A.	Western Reserve University	Ohio
Post, William R.	University of Kansas City	Midwest
Puckett, Ethel R.	Miami University	Ohio
Rehme, Kenneth A.	Xavier University	Ohio
Rho, Mannque	Clark University	New England

Root, Charles A.	Ohio Wesleyan University	Ohio
Rosenbrook, William Jr.	University of Omaha	Midwest
Rothuizen, Jasper W.	The George Washington University	Washington
Ruehl, Doris M.	Our Lady of Cincinnati	Ohio
Rysz, Walter	University of Scranton	Philadelphia
Schuler, Lawrence D.	LaSalle College	Philadelphia
Schwager, Irving	New York University	New York
Scott, Charles E.	Drexel Institute of Technology	Philadelphia
Shabaker, Robert	Lehigh University	Philadelphia
Sheely, William B.	Mississippi State University	Louisiana
Siegel, Sharon	Macalester College	Twin City
Sigman, David S.	Oberlin College	Ohio
Smith, Charles	Ohio State University	Ohio
Smith, Stephen M.	Northeastern University	New England
Snader, Kenneth M.	Philadelphia College of Pharmacy & Science	Philadelphia
Souers, Philip C.	Stanford University	Western
Spain, William H.	Pennsylvania Military College	Philadelphia
Stambaugh, Robert L.	Wabash College	Chicago
Stoldt, Stephen H.	Queens College	New York
Strebin, Robert S.	Oregon State College	Western
Suchma, Charles J.	John Carroll University	Ohio
Thurber, Sue	Adelphi College	New York
Thurston, Paul E.	Lafayette College	Philadelphia
Tolman, Chadwick A.	Massachusetts Institute of Technology	New England
Troman, Barbara A.	Pennsylvania State University	Philadelphia
Valcour, Francis L.	The College of the Holy Cross	New England
Wagner, Peter J.	Loyola University	Chicago
Ward, Nancy L.	Roosevelt University	Chicago
Whitehurst, Darrell D.	Bradley University	Chicago
Wintsch, Carol	St. Lawrence University	Beaver Falls
Wojcik, John F.	King's College	Philadelphia
Wolf, Philip	New York University	New York
Wuchter, James E.	Fenn College	Ohio
Yaffie, Sandra R.	Simmons College	New England
Zettler, Toby T.	Case Institute of Technology	Ohio
Zwillenberg, Melvin L.	Cooper Union	New York

A Symposium on Large Capacity Memory Techniques for Computing Systems will be held May 23-25, 1961, in the Department of Interior Auditorium on C St., between 18 and 19 Sts., N.W., Washington, D.C. Attendance is open to interested technical personnel. For information: Miss Josephine Leno, Code 430A, Office of Naval Research, Washington 25, D.C.

The Role of the Independent Laboratories in America's Progress

Dr. Roger W. Truesdail, F.A.I.C.

President, Truesdail Laboratories, Inc., 4101 N. Figueroa St., Los Angeles 65, Calif.

(Presented when the author received the Honor Scroll of the Western AIC Chapter, September 28, 1960, at the Los Angeles Athletic Club, Los Angeles, Calif.)

THE independent laboratories have made many substantial contributions toward America's progress. The start of America's technological trend dates back to the 1840's when our first mineral resources were discovered. But it was not until the 1880's that there was an apparent pragmatic interest in science and technology. It was during this period that a young chemist, Charles Martin Hall, after graduating from Oberlin, and while working in a woodshed laboratory, produced the first metallic aluminum of a few buttons. Aluminum has served the world ever since.

Since 1900 there has been an ever-increasing interest in technology and its fruits. But the first impact of industrial or applied research dates back to 1940. Just 20 years ago, we did not know of television, electronics, automation, atomic energy, wonder drugs, synthetic heart valves and arteries, jet propulsion or missiles.

A short span of years ago the average layman and some scientists considered members of the Southern California Rocket Society to be "grown-up boys" who wanted to play with their glorified sky-rockets. Yet they were simply following in the technical footsteps of the father of American rocketry, Dr. Robert H. Goddard, who launched the first liquid-fuel rocket on March 16, 1926.

The independent scientific laboratory profession in origin is as American as skyscrapers, malted milk shakes and hot dogs; standardization and quality control; inventive genius and mass production; and Benjamin Franklin, Thomas Edison, Harvey Firestone, Henry Ford, and the Wright brothers. The history of a great profession, like the history of a family or a nation, provides yet another view of the expansion of commerce, industry and technology. Unlike an industry that notes change only within its own field of interest, the independent laboratories have been situated with a panoramic viewpoint, provided by the many facets of commerce and industry that make up the national economy.

It is interesting to speculate whether the foundings of some of our independent laboratories in the late 19th century anticipated the need for scientific service organizations. There is little doubt, however, that mid-

way through the 20th century, industry would have been forced to create independent laboratories. For today, without such organizations within our industrial centers, commerce could only operate with great difficulty, uncertainty and controversy.

Apart from national recognition, and respect, our profession must be an impartial one and must also be diversely competent in many changing technologies. We are an integral part of the national economy. We are dedicated to assist the continuing development of America via the private enterprise system.

The independent laboratories are generally thought of as the "commercial" laboratory group, in contrast to the "captive" laboratories owned and operated by industrial concerns, or the laboratories of the educational institutions and the "non-profit" and tax-favored research institutes. The American Council of Independent Laboratories has agreed upon the following definition of "an independent laboratory":

> "An independent laboratory is a non-tax favored proprietorship, partnership or corporation, unaffiliated with any academic or governmental institution, or if affiliated with an outside industrial company or trade group, then not in any manner which might affect its capacity to conduct investigations, render reports or give professional counsel objectively and without bias."

The oldest independent laboratory in the United States was established about 95 years ago by Henry G. Hanks, who came to California during the gold rush days in 1852. He observed the need for refining borax and he established a laboratory. Further, he observed the need for the manufacture of fine chemicals, reagents and paints, and he carried on this work in conjunction with the assaying of gold ore and performing chemical analyses. Later the manufacturing was discontinued.

He built the first borax refinery in his state, obtaining the crude borax from borax springs at Clear Lake in Lake County. In fact, he did so much research work on crude borax that a mineral occurring in borax deposits was named "Hanksite." Thus it is believed that Henry G. Hanks was the father of independent laboratories. Under the name of his son, Abbot A. Hanks, the organization has prospered. In the Bay Area it maintains its original image of integrity and reliability. A number of other independent laboratories have served American industry for over 60 years.

There are over 1000 independent research, consulting, analytical and testing laboratories in this country, varying in size, staffed with approximately 12,000 persons. Some have as many as a dozen branch laboratories. Several retain internationally known scientists as research advisors. Not all laboratories do research and development. Some do testing, analysis, inspection and sampling—services also essential for America's progress.

The *Directory of Independent Commercial Laboratories Performing Research and Development* (National Science Foundation) lists 565 tax-paying independent laboratories performing R & D. Several dozen additional independent laboratories doing R & D were not included. Probably more have originated since its compilation. The directory preface states:

> "The growth of research and development expenditures during the past decade has been many fold. The independent commercial laboratories engaged in performing research and development are utilized by numerous small firms, a few of the larger industrial firms, and by agencies of the U. S. government . . . One hundred and seventy-five commercial laboratories reported research and development expenditures of $24 million . . ."

These, it is understood, were the research contracts handled by these 175 laboratories during a 12-month period.

Letters were directed to colleagues of 15 independent laboratories throughout the country to obtain typical examples of the contributions of the independent laboratories in America's technological explosion. The responses brought case reports totaling the equivalent of over 100 single-spaced typewritten pages. To each of them I am deeply indebted for their generous cooperation . . . Ethical care was observed by my colleagues to not specifically identify clients, process, or products other than those now a matter of public record. In similar vein the contributors will not be identified in connection with the cases reported.

Many of the industrial giants in this country were nursed as infants by the independent laboratories. A few which can be documented include: The Aluminum Company of America, Vanadium Corporation of America, Universal Oil Products Co. and the petroleum cracking industries, Celotex Company, Publicker Industries, the automotive industry, the furfural industry.

I referred earlier to Charles Hall and his production of metallic aluminum in 1886. After unsuccessful attempts to find a financial backer for his process, he came to Pittsburgh, where a small group, realizing its potential importance, formed the Pittsburgh Reduction Company which later became the Aluminum Company of America. This company initially was operated under the chemical control of one of America's oldest independent laboratories. Another independent laboratory provided the metallurgical know-how which made possible Henry Ford's first automobile engine.

The diversity of competence of the independent laboratories is made possible through the talents of their scientists and technologists of many disciplines and experiences. The enumeration by title or brief descriptions of only a few of the successful accomplishments reported will substantiate this statement:

Retention by the Book Manufacturers Institute to aid in upgrading the quality of textbooks for use in schools. This laboratory provides a technological arm whereby the materials, designs, and construction techniques are evaluated in the laboratory and then in the field to achieve a better quality, longer lasting and more effective textbook.

Analyses of nuclear materials and the development of new methods for the determination of trace impurities in exotic alloys.

Cooperation with the American Standards Association in development of end-use specifications for consumer and industrial textiles. Similar cooperation with the American Society for Testing Materials in the preparation of specifications in materials tests and design of the necessary laboratory instrumentation for conducting these tests.

Pioneer work in flammability measurements and flammability testing instrumentation has given textile manufacturers an opportunity to avail themselves of "before-accident" testing.

Earliest construction of a continuously variable auto-transformer, the forerunner of the now familiar Variac and similar commercial devices.

Basic research for more than ten years in establishing the principal physiological correlates of sleep by listing and classifying the basic elements of sleep and thus the ability to specify optimum sleeping conditions. Many of the technical articles generated from this program form basic building blocks in the field of human physiology.

Formulation of specifications and test instrumentation for the American Hotel Association which is used in the purchase of mattresses and other sleep furniture.

Development of analytical methodology leading to the evaluation of materials used in nuclear submarine power plants.

Development of production procedures whereby hours of machine polishing of plate glass can be eliminated through the use of chemical polishing techniques. Here again is a contribution to one of our basic technologies which will result in a less expensive and more readily available end-use product.

A laboratory management contract with the Atomic Energy Commission to conduct the official analyses for evaluation and purchase of uranium ore and mill concentrates throughout the Colorado plateau. Also, the responsibility for many uranium stock piles and for the government-owned Uranium Concentration plant, as well as for the procurement and maintenance of AEC property and materials in this area.

Research and subsequent field-testing, and development of the only currently successful method of either preventing scale formation or cleaning low-pressure, salt water evaporators on ships, of sludge or scale. Their developments are officially accepted by the U. S. Navy and the British Navy.

Seven years of research on the control of tanker corrosion in the refined and crude oil trade resulted in the development of a patented procedure which has proven very satisfactory. Internal tank corrosion is a serious problem, estimated to cost American tanker owners alone at least $20 million annually or on the average of $50 thousand to $150 thousand of damage per ship per year.

Extensive testing for the U. S. Air Force to determine creep resistance of lapped joints of aluminum sheet using epoxy resins as an adhesive. Tests were made at various temperatures and at various shear stresses. As a result epoxy resin joints have been used to replace rivets in some aircraft skin structures.

Many skyscrapers in large cities are currently being built with curtain walls of totally new designs. On one of the largest just completed in New York City, tests were conducted on the adhesion of the metal lining of 9000 curtain wall panels both before and after erection. A corollary to this was the set-up and operation of a complete weather station in a room of this skyscraper, 550 feet above ground, and it is recording night and

day the deflection of the large windows and their mullion framing. The advent of hurricane "Donna" gave this entire instrument set-up a drastic shake-down.

Research over 25 years has disclosed the unusual properties of beryllium, one of the most promising new metals for aircraft, missiles, space vehicles, and for nuclear applications. The Air Force needed basic information on beryllium alloys as did the Lawrence Radiation Laboratory of the University of California, and this was provided.

Research developed a method of making a detergent, sucrose monofatty esters, from sugar and fats. Since both of the latter are over-produced, the new detergent is expected to be quite economical.

Quick-drying water emulsion plastic paints, now so widely used, were developed and patented after several years of research.

Extensive research to determine the stress-rupture properties of tool steels at a great variety of stress levels and exposure temperatures up to 1000°F., ranging from a few minutes to 1000 hours or more.

Development of the first pre-formed shaving lather in a pressurized can and assignment of the patent to the client.

Investigations of underground power cable life as affected by operating voltage and the development of the exponential law relating life and test voltage.

Successful concentration of a large volume export pharmaceutical product which permitted substantial transportation cost savings, since it could be reconstituted and bottled at its destination.

Concept to use perlite, produced from lava rock, as a replacement for sand in soil potting mixtures, since it is only 20% as heavy as sand and holds as much as 300% of its own weight in water. Its surface area holds water which can be used by transfer to root systems, and thus permit long distance shipping of plants.

Development of the slow-motion silver-contact switch, now widely used on electric ranges and to control lighting circuits.

Tests in animals under actual use conditions of new alloy prosthetic devices which will enable maimed and crippled persons to benefit from a longer lasting, lighter weight, more easily formed—thus better fitting—device to substitute for missing, deformed, or malfunctioning members.

Development of a special type of solder and flux, and procedure of application which permits the joining of large areas of dissimilar metals.

Production of the prototype of a revolutionary and inexpensive small electric driven automobile for about-town errands. This may be the answer for a "second car."

Development of a scientific basis for design and performance characteristics of automatic electric flatirons which were subsequently and generally adopted in this branch of the electrical appliance industry.

Research leading to the development of a fluid for the flotation of precision gyros used in inertial guidance systems for the armed services.

Creation of a plastic spray antidesiccant reduces moisture loss in plants and permits nurserymen to sell and plant trees of all varieties and sizes during all seasons of the year instead of the previous limited periods.

Evaluation of potential corrosion inhibitors to be added to ocean water to prevent failure of casings, for subsurface pressure injections to curb land subsidence as well as to increase oil recoveries.

Investigation to dispose of hide trimmings from a tanning plant, disposal of which was both difficult and costly, resulted in an inexpensive process for their incorporation in the preparation of high energy animal feeds with a current demand greater than the supply.

Evaluation tests upon drill cores from coal deposits to determine quality and whether metallurgical coke can be made for the steel industry.

Development of inks, printing procedures and special end coding and decoding devices for use in reducing the possibility of counterfeit checks.

Development at a cost of $1 million of an electronic instrument for class-

ing cotton fiber to replace the variable human cotton classing instrument.

Research over a 3-year period on the development of a new method of packaging plants with a good soil mix to assure maximum survival during storage, shipping and displaying, and providing a package which can be planted by merely digging a hole and dropping the package in the hole.

Development of a new and revolutionary nitrogen fertilizer which is now known as urea-formaldehyde.

Some of the independent laboratories are playing an important role in the entry of man into space. They started with the design and construction of prototype missiles and carried on through the testing of mechanical and electronic components. Several laboratories have gone on to establish rocket fuel control laboratories at some of our missile hardsites. One of these has made a basic contribution in the field of electronic component testing with respect to performance and reliability. Chemists, statisticians, engineers and physicists working side-by-side in this laboratory have written specifications and procedures which assure men of functional control and reliability. A number of the laboratories are involved in the performance testing of various hardware and fuels for missiles.

The independent laboratories are aware of the grave problems which face America today, arising from the pressures generated by the increasing world population, by the Communist strategy of protracted conflict in all areas of human activity, and from the political and social aspirations of under-developed countries and the determination of their people to seek the fulfillment of their aspirations through technology.

Technology is increasing in importance as an instrument of national power and prestige. The technological monopoly once enjoyed by the nations of the West is disappearing. One example: The sobering prediction of recognized space technologists that Americans will probably not be the first humans to set foot on the moon or go into orbit.

The independent laboratories, through the talents of their scientists of many disciplines and experiences, expect to assist our United States in the technological competition in the world arena. America must retain its leadership in technology, its leadership as a world power, and preserve intact our system of free enterprise. To this end, we of the independent scientific laboratories recognize our responsibilities.

The Skinner Chuck Co., New Britain, Conn., has changed its name to Skinner Precision Industries, Inc.

Roger W. Truesdail, the Citizen

Morris B. Pendleton

President, Pendleton Tool Industries, Inc., Los Angeles, Calif.

(A condensation of a talk presented when Dr. Truesdail received the Honor Scroll of the Western Chapter, at Los Angeles, Calif., Sept. 28, 1960)

DR. ROGER W. TRUESDAIL exemplifies the principles that a man should first be a good citizen, and second a good professional or businessman. Looking back into history, what profited the shoemaker or shipbuilder in Rome, when the Gauls came in? If the Romans had been good citizens first, they might have saved their empire.

Roger is best known as the founder and president of Truesdail Laboratories, Inc., which he founded in 1931 in Los Angeles in one room. Truesdail Laboratories now own two buildings of 8000 sq. ft. of floor space and are planning an additional building with 4000 sq. ft. more. They have a branch laboratory at Terminal Island, Calif., and branch offices in San Francisco and Honolulu. Their clients include national and international corporations, individuals and organizations. Dr. Truesdail is a registered professional engineer, California No. 1607.

In Northern California, Truesdail Laboratories associated themselves with Abbot A. Hanks, Inc. This team of air pollution control specialists has gone about the problem in Northern California in a sensible, non-political and scientific manner . . .

Roger's citizenship activities began at the University of Redlands where he was athletic manager for all sports. He also served as manager of the University's Men's Glee Club and sang first tenor. This glee club was awarded a two-weeks' trip to Chicago sponsored by the Santa Fe railroad. Further as a citizen and to pursue his chosen field, Roger served as assistant in the department of chemistry. He was elected president of his senior class and a member of Kappa Sigma Sigma fraternity.

His military experience was in World War I as a member of the SATC of the U. S. Army.

While at Redlands he was the business manager of the weekly newspaper, *The Redlands Graphic* and editor of *Redlands—Twixt Mountains, Desert and Sea.*

One of the principal characteristics of the U.S.A., in contrast with many other countries in the world, is the willingness of many people to give of their time, talents and treasure as good citizens to nonprofit enterprises. As for Dr. Truesdail, he has actively participated in community services, some of which are:

Board of Trustees and member of the Executive Committee of the University of Redlands, 1935-present. Chairman, Trustees Faculty Committee.

Board of Trustees, Southern California School of Theology, 1955-present.

Board of Directors, South Pasadena Y.M.C.A. (8 years)
Member of first Recreation Commission, South Pasadena (3 years)
Moderator, Oneonta Congregational Church, South Pasadena (2 years)
President, Rotary Club of Los Angeles (1946-1947)
Board of Directors, Rotary Club of Los Angeles (1943-1945)
Secretary, Rotary Club of Los Angeles (1941-1942)
Publication Chairman, "History of the Rotary Club of Los Angeles," 1955
President, Oneonta Club, South Pasadena (1941-1942)
Member, Original Citizens Smog Committee, Los Angeles
Member, Pasadena Tournament of Roses
Member, Aviation Committee, Chamber of Commerce of Los Angeles
Member, University Club of Los Angeles
Member, Y.M.C.A., Pasadena
Conductor and writer of the monthly science page, "Peeps at Things to Come" in *The Rotarian magazine.*
Editor, *Chemistry in Action,* now in 22nd year of publication. For the second time during the past three years, Truesdail Laboratories, Inc., is the recipient of a George Washington Honor Medal for *Chemistry in Action,* "An outstanding achievement in helping to bring about a better understanding of the American Way of Life during 1959." The presentation award was made by Mr. Herbert Hoover, Jr., on behalf of the Freedoms Foundation, May 31, 1960. The citation read, "For its company newsletter, *Chemistry in Action,* and the support given in its pages to sound freedom concepts."

Roger, in addition to being exceedingly generous with his time and talents, has been liberal with his treasure in connection with his affiliations. Particularly, five years ago, he inaugurated an annual scholarship award of $1000 each year to an outstanding student majoring in chemistry at the University of Redlands. This is listed in their catalog as the "Truesdail Chemistry Scholarship Award."

On the personal side, Dr. Truesdail in 1923 married his childhood sweetheart, Dorothy Painter. They have three married daughters and ten grandchildren. They live in Pasadena near Cal-Tech, and have a mountain home at Lake Arrowhead.

Dr. Truesdail's current hobbies are trout fishing and color photography. For some five years, he owned and flew his own airplane, having clocked over 500 solo hours.

He is a popular speaker, both nationally and internationally. In connection with numerous trips about the world, he has filled speaking engagements in at least the following places:

The Norwegian University of Agriculture (Oslo)
The Royal Academy of Engineering Sciences (Stockholm)
Swedish Institute for Food Preservation Research (Gotenburg)
Skanska Ingeniorsklubben (Malmo)
Amsterdamsche Chemishe Kring (Amsterdam)
Rotary Clubs of: Honolulu, West Honolulu, Waikiki, Pearl Harbor, Windward Oahu, Hilo
Industrial Development Conference (Chamber of Commerce of Honolulu)
The Adjusters Association of Hawaii
The Free Chinese Association for the Advancement of Science: Tapei, Taiwan.

Dr. Roger W. Truesdail, the citizen, has been generous with his time, talent, and treasure.

Roger W. Truesdail - - Scientist

Dr. Clinton H. Thienes

Director, Institute of Medical Research, Huntington Memorial Hospital, Pasadena, Calif.

(Condensation of a paper presented when Dr. Truesdail received the Honor Scroll of the Western AIC Chapter, Los Angeles, Calif., Sept. 28, 1960.)

WHAT type of scientist is Dr. Roger Williams Truesdail and to what degree of scientific achievement has he risen?

Let us look into the meaning of the word "scientist." My unabridged dictionary passes it over lightly by stating that a scientist is one learned in science; a scientific investigator. The definition of "science" is more satisfying.

> First, it is knowledge; knowledge of principles or facts. Science is accumulated or accepted knowledge, systematized with reference to the discovery of general truths or laws, classified and made available in work, life or the search of truth, especially when it relates to the physical world and its phenomena. Science is also defined as art or skill resulting from knowledge within a special field. Finally, science comes from the Latin word "scire" meaning "to know," through its French derivative having the same spelling as the English word.

The first act in the acquiring of knowledge is study. The Bible teaches "study to know." Introduced to the Bible in early life, Roger followed this precept. He was born in Burlingame, Kansas, Feb. 6, 1899. He attended grammar or primary school in Quenamo, Kansas, and worked as a "printer's devil" in his father's printing and publishing shop. There he came under the influence of William Allen White, the great editor in Emporia, which is but 30 miles southwest of Quenamo. No doubt he learned something of the technic of searching for facts about people and events from this great man.

In 1913, his father moved the family to Redlands, Calif., where he bought the Citrograph Printing Company and where Roger went to high school and to the University of Redlands while still working in his father's shop. During this period he acquired the art of dissemination of knowledge through the written word, which he has exercised ever since. An outstanding example is his four-page publication, *Chemistry in Action*, which contains interesting information and occasionally profound words of wisdom. During summer vacations, while at the University, he was employed in the technical field service of the Pacific R & H Chemical Company (later a branch of E. I. du Pont de Nemours) and the California Cyanide Company, instructing orange grove fumigators in the use of liquid hydrogen cyanide. Thus began his teaching career and his interest in toxicology.

He began his graduate training at the University of Oregon under another Roger Williams, the discoverer

of pantothenic acid, then professor of organic chemistry there (and brother of R. R. Williams of the Bell Telephone Co., discoverer of thiamine.) Under Dr. Williams (now at the University of Texas), Roger began his life-long career as a scientific investigator. He published jointly with Dr. Williams a paper entitled, "Ionization of Alcohol" in the *Journal of the ACS* in 1923, a year after he received the M.S. degree from the University of Oregon.

Although his research on alcohol ionization was in the field of basic science, he must have been influenced by Prof. Williams toward his career in applied science, for Williams was interested in vitamins, and when Truesdail went on to the University of Washington, his research was on the relative contents in Pacific Coast salmon body oils of the then mysterious vitamin A. This work was published jointly with Prof. Boynton in 1931. Thus Roger has demonstrated the possession of three of the characteristics of a scientist: curiosity, skill in investigation, and the ability to disseminate knowledge.

After his graduate year at the University of Oregon, he spent a year as head of the departments of chemistry and physics at Mt. Angel College, near Salem. Then he was called to the University of Redlands as acting head of the department of chemistry. After these two years of teaching, he became a candidate for the Ph.D. degree at the University of Washington, 1924-1926. Roger and his wife, Dorothy, operated an apartment house in Seattle, to pay living expenses, having by this time acquired a baby daughter. In those days it was a pioneer venture for a married man to pursue graduate studies; today it is commonplace.

Dr. Truesdail then instructed at the University of Nevada and was assistant professor at Pomona College for four years, ending his full time teaching career in 1931. It was then that he initiated, organized, and established on a permanent basis, Truesdail Laboratories, Inc. Beginning in 1935, he held a lectureship in chemistry at the University of Southern California for nine years.

Many of the students introduced to chemistry and physics in his lecture room and laboratories have gone into scientific work. I have chosen two for special mention. Both graduated from Pomona College in 1929. Lloyd Custer Miller went to the University of Rochester to receive the Ph.D. degree in 1933. He is now director of revision of the *United States Pharmacopeia*. Norris Edwin Bradbury, Ph.D., D.Sc., LL.D. is director of the Los Alamos Scientific Laboratories, and professor of physics of the University of California.

Although his pride in teaching such students was great, Dr. Truesdail chafed under academic restraint. His research in the field of nutrition had

attracted the attention of the agricultural and food processing industries and he became a consultant in this field. In 1931 he had to make a difficult choice between the academic cloister and the operation of an independent consulting laboratory. He chose independent work.

His earlier scientific papers concerned the nutritive values of foods produced on the Pacific Coast. He reported on the vitamin A content of salmon, tuna, orange, and sugar beet; the vitamin D content of sardines, tuna, irradiated and non-irradiated yeast; the vitamin B content of yeast; the anti-anemic properties of avocados, dates, walnuts, and liver. In the veterinary field he made chemical and spectrographic analysis of rabbit's milk and studied the effect of diets on the occurrence of bladder stones in cats.

Recently, the influence of his early years in journalism has been most apparent. His scientific reviews and articles have appeared in such educational or trade periodicals as the California *Parent-Teacher Magazine*, THE CHEMIST, *Chemische Weekblad*, the *Alumnus* of the University of Redlands, *The Cooperative Poultryman*, *Diamond Walnut News*, *American Independent Baker*, *Western Industry*, *Food Technology*, and the *Pacific Factory*. One paper, entitled, "Who is Responsible for What Research?" in which he argues that university laboratories should be concerned with basic science and that applied research should be the responsibility of industrial and independent laboratories, was published in the *Congressional Record*, June 24, 1958.

In the war years, Truesdail Laboratories did less work in nutrition and more in physics, industrial chemistry, industrial engineering, bacteriology and air pollution. The Truesdail Laboratories were pioneers in the analysis of Los Angeles smog and have collaborated with Dr. A. J. Haagen Smit and others in this endeavor.

One of the marks of scientific achievement is acceptance into membership in scientific societies. Dr. Truesdail is a member or fellow of several, including the AIC, the American Chemical Society, the American Public Health Association and the Institute of Food Technologists. He has been prime mover, president and secretary of the American Council of Independent Laboratories and founder of its Western Division. He has been president of the Association of Official Racing Chemists, and a committee member of the Medical Research Association of California. He is a member of Sigma Xi and Phi Lambda Upsilon.

Dr. Roger Williams Truesdail is one of Southern California's prominent scientists.

Dr. Fisher, Dr. Truesdail, and Stuart R. Garnett

THE Honor Scroll of the Western Chapter of THE AMERICAN INSTITUTE OF CHEMISTS was presented to Dr. Roger W. Truesdail, president, Truesdail Laboratories, Inc., Los Angeles 65, Calif., at a dinner meeting at the Los Angeles Athletic Club, September 28, 1960.

Stuart R. Garnett of the Blue Diamond Company, Los Angeles, chairman of the Chapter, presided. Morris B. Pendleton, president, Pendleton Tool Industries, Inc., Los Angeles, spoke on "Roger W. Truesdail, the Citizen." "Roger W. Truesdail, the Scientist" was the subject of a talk by Dr. Clinton H. Thienes, director, Institute of Medical Research, Huntington Memorial Hospital, Pasadena.

Dr. Harry L. Fisher, past president of the AIC, who presented the Honor Scroll, said that, while in college, he had bought a book of the translations of the great poet Horace, who flourished at the time of Caesar Augustus. "Not until recently did I read that book and I enjoyed it. In one case Horace states, 'The man who makes the experiment deservedly claims the honor and the reward!'"

In accepting the scroll, Dr. Truesdail introduced the following, longtime members of his staff: Dr. C. E. P. Jeffreys, technical director; Mrs. Margaret J. Winbourne, chemist; A. W. Zahner, chief chemist; Mrs. Bette H. Porter, office manager; Alvin E. May, director of technical services, and Dr. Philip J. Charley, vice president and research chemist. He also presented Mrs. Helen Jean Culbertson Fowkes, who was his first staff member in 1931.

The citation on the Scroll reads:

To: Dr. Roger W. Truesdail

In recognition of his unusually intense interest and influence in promoting truly professional attitudes and constructive actions in the profession of chemistry; for his enthusiastic positive direction in guiding and promoting professional growth of young chemists; for his active participation and recognized leadership in technical and civic organizations.

How Do Chemists Work?

Dr. J. F. Abere, F.A.I.C.

Project Mgr., Chemical Division, Minnesota Mining & Manufacturing Co., 367 Grove St, St. Paul, Minn.

(A report on a panel discussion held by the Twin City AIC Chapter. This report is slightly condensed from *"The Minnesota Chemist,"* Nov.-Dec. 1959.)

USING the viewpoint that "education begins at home," the Twin City Chapter organized a husbands-and-wives meeting with a panel discussion on, "What I Think My Husband (or wife) Does in an Average Day's Work."

The panel was chosen to represent both industrial and academic activities, and also to obtain the views of both husbands and wives of practicing chemists and chemical engineers. Panel participants were Mrs. Lloyd Reyerson, Mrs. John Scott, Mrs. Morris Kenigsberg, Mr. Hub Sherman, and Mr. Ernest Rylander.

As starting points in the discussion, the panelists were asked:

(1) What do you think occupies most of your husband's (wife's) time?
(2) What do you think is the most difficult phase of his work?
(3) What do you think should be done to improve his working conditions?
(4) Would you want your children to be chemists or chemical engineers in teaching or industry?
(5) Do you believe the "man on the street" has a good idea of what a chemist or chemical engineer does?

The panel was also provided, at appropriate times during the discussion, with detailed, minute-by-minute, anonymous records of the activities of a local practicing industrial research chemist, a University of Minnesota chemistry professor, and a person engaged in technical administration in industry. Although these records were regarded as typical, they can not be regarded as routine, since the pattern of activities could change greatly from day to day.

One record was:

Typical Day of a University of Minnesota Chemistry Professor

8:40-10:00 a.m. Worked on book manuscript.
10:00-10:30 a.m. Prepared for a lecture.
10:30-11:30 a.m. Delivered lecture.
11:30-12:00 a.m. Wrote out instructions for the lab instructors.
12:00- 1:00 p.m. Lunch.
1:00- 1:30 p.m. Made exam paper for freshman chemistry section.
1:30- 2:00 p.m. Correspondence.
2:00- 3:30 p.m. Met with committee on undergraduate chemistry.
3:30- 4:20 p.m. Delivered lecture.
4:20- 4:45 p.m. Answered questions and solved problems for students.
4:45- 5:15 p.m. Tested lecture demonstration.
5:20 p.m. Left for home.
9:00-11:30 p.m. Study and reading at home.

The discussion that followed was spirited and continued for an hour and a half. The panelists presented opinions, but the high level of interest in the subject led to considerable discussion by non-panelists. The principal points brought out in discussion were:

The wives of those engaged in teaching had a much better understanding of the work activities of their spouses. But part of this was mechanical in that the college professor had to submit a schedule of classes, in order to be reached by a telephone call from home. However, the over-all knowledge of teaching spouses' scheduled activities undoubtedly enhanced the home knowledge of what the other half was doing. It was also obvious that the greater importance of joint husband-wife social activities, as related to campus activities, was proportionately a much greater factor for mutual participation than that found with their counterparts in the industrial research area.

In contrast, the husband or wife of the industrial chemist or chemical engineer did not have as good a knowledge of the hour-by-hour activities of their spouses. However, on one important point they had a rather good estimation; that was in the amount of time actually spent at the bench in experimental work. It has been evident in surveys ("Chemists Profile Redrawn," *C & EN*, Apr. 6, 1959) that many aspects of industrial development and research work require a large amount of time spent in communicating, planning, thinking, reading, and writing. This results in only about one-third of the chemists' or chemical engineers' time being spent in equipment set up and use. Here is a summary of one day's activities:

Typical Day — Industrial Research Chemist

8:10 a.m. Arrived at work.
8:10- 8:35 a.m. Outlined the day's experiments.
8:15- 9:05 a.m. Read technical literature.
9:05- 9:25 a.m. Witness notebook for legal purposes.
9:25-10:00 a.m. Helped laboratory assistant in experiments.
10:00-11:15 a.m. Calculations on data and recording data.
11:15-12:00 a.m. Lunch.
12:00-12:30 p.m. Browsed in library.
12:30- 1:30 p.m. Calculations on data and recording data.
1:30- 2:10 p.m. Conference with other chemists.
2:10- 3:15 p.m. Discussion with divisional research chemist.
3:15- 4:00 p.m. Background reading.
4:00- 4:20 p.m. Correspondence.
4:20- 4:40 p.m. Checked with lab assistant on experiments.
4:40- 4:50 p.m. Discussion with project leader.
4:55 p.m. Left for home.
8:30- 9:45 p.m. Read current technical literature pertaining to field.

The panel was rather quick in arriving at conclusions which indicated that the use of the teaching scientist was well appreciated by the spouse at home, because the work dealt with the easily apparent role of training young people to be more productive. It was also felt that, outside of those closely associated with the scientist-teacher, there was little appreciation for the difficult and demanding work involved.

For the wife or husband of the industrial scientist, there was a good understanding of the general nature of his activities, and a surprisingly

good idea of his time distribution on the job. Knowledge of the details of activities on the job varied widely, depending upon the type of work involved. Particularly where the subject area concerned led to consumer goods products, interest and knowledge was high. However, if the end product was more abstract, the apparent level of interest and questioning of the work area diminished greatly.

In answer to questions to the panel such as, "Would you want your son or daughter to follow in your husband's or wife's footsteps as an industrial scientist or college teacher," most spouses felt quite definitely "yes," if the child had the necessary aptitude. Income improvement was cited as a desirable feature, particularly in some areas of the teaching profession, but a large factor relating to esteem was lack of outside understanding of the job, and particularly, the lack of the layman's understanding of the wide range of abilities and knowledge required in the teaching area.

It was almost unanimous that more and better training in communication for the potential scientist, while he was in high school and college, was needed. It appeared that the practicing teacher at the college level and the industrial scientist were doing about 50% of the job of communications at home and that they could be improving knowledge of their profession greatly by more thought on this area. It was also apparent that if a better job was done in this type of communication, particularly in preparing the husband or wife of the industrial scientist or scientist-teacher to communicate with their associates, we would be doing an important service to our profession.

It All Depends on the Point of View

To the non-smoker, the invention of the filtered cigarette seems to be a matter of no moment; a detailed description of the best method of mixing the most complicated but allegedly delicious cocktail appears fatuous to the non-drinker; a blow by blow account of scoring a birdie on the shortest hole on some course or other has frequently decided a non-golfer to remain a non-golfer.

The Atom in Perspective

(Excerpts from remarks by Dr. Robert E. Wilson, Commissioner, U. S. Atomic Energy Commission, presented at the Second National Youth Conference on the Atom, Chicago, Ill.)

YOU will hear many interesting and inspiring presentations—how radioisotopes can be used in science and industry to work out the mechanism of many complex reactions; to make possible sensitive automatic controls for many operations; and how in medicine they can greatly facilitate diagnosis and even cure of important diseases. You will also hear of the manifold ways in which atomic radiation can aid agriculture, animal husbandry, and food preservation.

You have heard of many different ways in which power can be developed from the atom, and of the important role that atoms are bound to play in helping to meet the world's rapidly expanding needs for power . . . Truly, the field of the atom is a fascinating one, especially for a group of able and eager young men who are considering future careers in science . . .

But nuclear energy is not likely to become important in the fields of transportation or home heating, or most other areas which petroleum and coal have long served. The petroleum, coal, automotive, aviation, electrical, chemical and many other industries will for many decades be employing even more chemists, physicists and engineers than they do today.

Atomic energy will grow, too, but if all of you, and many other prospective scientists and engineers, rush into a single field of activity, many of you will probably end up in some of the many older fields which will still offer outstanding opportunities. Not that that would be particularly disadvantageous, either for you or the general economy. After all, the whole brunt of the wartime atomic weapon development was borne by scientists and engineers who had specialized in other fields and had studied virtually nothing about atomic fission in school.

What I want to emphasize is that you should not overspecialize in any field, at least before graduate school. The important thing is to get a good fundamental education which will equip you to master any new technology if you simply make up your mind that your formal education will not mark the end of your period of study and learning. With science developing so rapidly, if you plan on that as a career you might as well reconcile yourself to the fact that, if you are to keep up with even one field of science, your learning process must continue indefinitely.

W. R. Grace & Co. New York, N. Y., announces that Osgood V. Tracy has been elected a director and executive vice president. He was formerly president of Esso Standard.

When Science is a Woman's Work

Dr. Frances Greer

(Research Chemist, Hercules Powder Company, Research Center, Wilmington, Del.)

(Reprinted from the *Hercules Chemist*, No. 40, Oct. 1960.)

IN almost every newspaper and popular magazine of the past few years, we find the inevitable article on women in pursuit of a career. This topic has become increasingly popular with both lay and professional psychologists, and with a number of writers whose facility with words far exceeds their knowledge of a subject which has been analyzed, explained, and described until the term "career woman" automatically invokes a response ranging from pity to perplexity.

The implication of the word "career" is one of a continuing occupation carried out over a long period of time and, correctly or not, it ordinarily implies a special aptitude or training for the work being done. From a feminine standpoint, therefore, the duties of a housewife are as much a career as are those of the professionally trained lawyer, engineer, or diplomat.

Women have held jobs in the non-technical areas of industry for many years, but only in the last few decades have women with advanced degrees in the natural and physical sciences and in engineering begun to infiltrate the predominantly masculine domains of research, development, and even production. Unfortunately, the opinion most frequently expressed by women themselves about their reluctance to enter industry is to the effect that there exists an excessive discrimination in regard to both salary and opportunity for advancement. While this is undoubtedly true to some extent, it is also an over-simplification, since the greatest barriers to a woman's advancement are those which she, herself, erects.

Acquiring a doctorate in one of the physical sciences, for example, places a woman in the midst of rather ruthless competition to survive the preliminary elimination occurring in the first year or two of study. Having surmounted this obstacle, she finds it all too easy to graduate with degree in hand and chip on shoulder. Although the number of women receiving Ph.D. degrees is constantly increasing, the phenomenon is still of sufficient rarity to result in an uncertainty of purpose in the mind of the recipient as well as the prospective employer. Of careers other than in chemistry, I know very little; but I am sure that they are as challenging and rewarding as the one which I, by choice, pursue in industry. I am equally confident that there is no predetermined limit which bounds the advancement that can be made by a woman, any more than such a limit

exists for a man in the same field. It is a fallacy to assume, however, that one should expect a continuous progression to an administrative position. A scientific degree is not an open-sesame to a vice presidency for either sex, and this can hardly be classed as discrimination.

To succeed in a scientific profession, there seem to me to be two things which a woman should bear in mind. The first is the obvious requirement that she should equip herself with a sound technical knowledge of her field. In this respect there is no difference in what can and should be expected from either a man or a woman. In the second place—and departing radically from generally accepted opinion—she should not try to think like a man. The most likely candidate for successful masculine thinking is certainly a man. A woman can contribute equally well by employing those strictly feminine characteristics with which she is naturally endowed —intuition, infinite patience, and a certain desirable mysticism.

Chemistry is nothing more than the manipulation of miniature molecular machinery. To a man, a molecule is just this: a captivating machine to be modified, repaired, or directed as the problem at hand dictates. It is as fascinating as the inside of his automobile and as challenging as the exploration of space. This is an eminently successful approach but not necessarily the best or only one in all circumstances. To a woman, a molecule possesses quite human characteristics. To her, the solution of a problem involves acquiring an intimate knowledge of the "personality" of a molecule, learning its likes and dislikes, and basing an approach to a problem on the manner in which the moelcule can be led, rather than driven, to reacting in a desired way. This may seem teleological; but it also is effective.

In industry, as in any endeavor, a dual approach to a problem increases the opportunity for solution. Industry is neither designed nor equipped to serve as a battleground of the sexes. It is a place for cooperation, rather than an arena for attempting to settle the immaterial question of which sex possesses the better mental processes. Both men and women have a tremendous contribution to make, and very few problems can escape solution when attacked cooperatively with the combined intuitive and direct approach.

The Fiber Society, P.O. Box 405, Athens, Georgia, announces that it has established an annual award for "distinguished achievement in basic or applied fiber science." The award and $500 will be given to a young scientist for achievement completed before his 35th birthday. Previously existing awards cover other contributors to fiber science.

About AIC Members

Dr. C. A. Stiegman, F.A.I.C., newly elected vice president—research and development, for Hooker Chemical Corp., Niagara Falls, N. Y., announces that **Dr. Alvin F. Shepard,** F.A.I.C., has been appointed senior scientist in the research and development department.

Dr. Robert L. Bateman, F.A.I.C., of Union Carbide Chemicals Company, New York, N. Y., received the Honorary D.Sc. degree from his alma mater, Ursinus College, at the Founders' Day Convocation, Collegeville, Pa., Oct. 23, 1960. He was cited for his work in commercial chemical development and his many publications in the field of petrochemicals.

Dr. Max Tishler, F.A.I.C., president, Merck Sharp & Dohme Research Laboratories Division of Merck & Co., Inc., Rahway, N. J., announces that Dr. Charles W. Mushett has been appointed director of scientific relations.

Dr. Peter G. Arvan, F.A.I.C., has been appointed a director of sales in the Market Department of the newly formed Agricultural Chemicals Division of Monsanto Chemical Company, St. Louis, Mo.

Gerald J. Bayern, F.A.I.C., is now director of commercial development for Bzura Chemical Co., Inc., Clark Street off Broadway, Keyport, N. J.

(*Also see inside back cover*)

DONATION TO ACS BUILDING FUND

The Board of Directors of the New York ACS Section contributed to the ACS Building Fund to honor past chairmen of the Section. Dr. John H. Nair, F.A.I.C. (second from left), chairman of the Fund, accepts the check from John Kotrady, F.A.I.C. (second from right), treasurer of the Section. Fisher Gaffin, F.A.I.C. (right), is the Section chairman; Dr. Charles G. Overberger, F.A.I.C. (left), is past chairman of the Section.

Professional Appointments

Dec. 1, 1960. Constableville, N. Y. Hotel Parquet. Social hour 6:30 p.m. Dinner 7:30 p.m. Meeting of Beaver Falls Chapter. Speaker, J. D. Parker, Atomic Energy of Canada Ltd. Subject: "Radioisotope Applications." For information: Carlton Force, Latex Fiber Industries, Beaver Falls, N. Y.

Dec. 1, 1960, Philadelphia, Pa. Luncheon meeting of Philadelphia Chapter. For information, Dr. Ezra Bitcover Secretary of the Chapter, c/o U. S. Department of Agriculture, Eastern Utilization Research Div., Philadelphia 18, Pa.

Dec. 6, 1960. Niagara Falls, N. Y. Red Coach Inn, Buffalo Avenue & Main St. Meeting of Niagara Chapter. Social Hour, 6:00 p.m. Dinner 7:00 p.m. Speaker, Dr. Milton Harris, AIC President, "The Position of the Chemist in our Society." For reservations (Dinner $3.00), Dr. J. Frederic Walker, c/o E. I. du Pont de Nemours & Co., Niagara Falls, N. Y. (BU 5-7831, Ext. 421).

Dec. 7, 1960. New York, N. Y. The Chemists' Club, 52 E. 41st St. Meeting of AIC Board of Directors and National Council. Board meets at 5:30; Council at 6:00 p.m.

Dec. 7, 1960. New York, N. Y. The Chemists' Club, 52 E. 41st St., Meeting of Advisory Board of The Chemist. Luncheon 12 noon.

Dec. 9, 1960. Minneapolis, Minn. (Place to be Announced) Meeting of Twin City Chapter. Panel discussion. Subject to be announced. (Possibly a follow-up on what the modernized teaching will mean for the profession of chemistry.) For information: Dr. H. L. Weisbecker, 2138 Berkeley Ave., St. Paul, Minn.

Dec. 13, Huntsville, Alabama. Russel Erskine Hotel. Meeting of Alabama Chapter. For information, Robert E. Lacey, Southern Research Institute, 2000 9th Ave. So., Birmingham 5, Ala., or Martin B. Williams, Redstone Arsenal, Huntsville, Jefferson 6-4411, Ext. 876-4343.

Jan. 18, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. Otto Eisenschiml, F.A.-I.C., Scientific Oil Compounding Co., For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

Jan. 19, 1961. Minneapolis, Minn. (Place to be announced) Honor Scroll Presentation meeting of Twin City Chapter. Dr. Milton Harris, AIC President, will discuss program and plans for AIC. For information: Dr. H. L. Weisbecker, 2138 Berkeley Ave., St. Paul, Minn.

Jan. 19, 1961. New York, N. Y., The Chemists' Club, 52 E. 41st St. Meeting of the New York Chapter. Speaker, Robert Kampschulte, Vice President, Sales, Celanese Chemical Co., New York, N. Y. Subject, "Marketing." (Part of the theme, "What Every Chemist Should Know about the Chemical Business.)

Feb. 2, 1961. Philadelphia, Pa. Penn-Sherwood Hotel, 3900 Chestnut St. Honor Scroll Award meeting of Philadelphia Chapter. Topic and Awardee to be announced. For information: Dr. Ezra H. Bitcover, Chapter Secretary, U. S. Dept. of Agriculture, Eastern Utilization Research Div., Philadelphia 18, Pa.

Feb. 7, 1961. Meeting of Niagara Chapter. Place, subject, and speaker to be announced. For information: Prof. Howard W. Post, Secretary of the Chapter, Chemistry Dept., University of Buffalo, Buffalo 14, N. Y.

Feb. 10, 1961. New York, N. Y. Place to be announced. Joint AIC-ACS meeting under the auspices of the ACS. Subject and speakers to be announced.

Feb. 15, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. A. C. Ivy of the University of Illinois. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

Feb. 16, 1961. Watertown, N. Y. Hotel Woodruff. Dinner meeting, Beaver Falls Chapter. Social hour 6:30 p.m. Speaker: Dr. Johan Bjorksten, President, Bjorksten Research Labs., Madison, Wis. Subject: "Aging and Its Professional Implications." Ladies Invited. For information: Carlton Force, Latex Fiber Industries, Beaver Falls, N. Y.

Mar. 2, 1961. Minneapolis, Minn. (Place to be announced) Joint meeting of Twin City Chapter with Minnesota Section ACS, Twin City Section of AIChE, and the Minnesota Industrial Chemists Forum. For information: Dr. H. L. Weisbecker, 2138 Berkeley Ave., St. Paul, Minn.

Mar. 8, 1961. Chicago, Ill. Builders Club. Joint meeting of Chicago Chapter with AIChE. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

Apr. 6, 1961. Philadelphia, Pa. Luncheon meeting of Philadelphia Chapter. For information, Dr. Ezra Bitcover, Secretary of the Chapter, c/o U. S. Department of Agriculture, Eastern Utilization Research Div., Philadelphia 18, Pa.

Apr. 13, 1961. Watertown, N. Y. Hotel Woodruff. Social hour 6:30 p.m. Dinner 7:30 p.m. Meeting of Beaver Falls Chapter with TAPPI. Speaker, Dr. K. A. Arnold, T.D., St. Regis Paper Co., New York, N. Y. Subject: "The Planning of a Technical Center." For information: Carlton Force, Latex Fiber Industries, Beaver Falls, N. Y.

Apr. 19, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. E. J. Sparling of Roosevelt University. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

April 20, 1961. New York, N. Y. Place to be announced. Meeting of New York Chapter. Presentation of Honorary AIC Membership to Dr. Lloyd Van Doren, retired AIC Secretary. Subject of discussion, "Chemical Patent Procedure."

May 4, 1961. Paoli, Pa. Paoli Inn. Student Honor Award Meeting of Philadelphia Chapter. Topic and Speaker to be announced. For information: Dr. Ezra H. Bitcover, Chapter Secretary, U. S. Dept. of Agriculture, Eastern Utilization Research Div., Philadelphia 18, Pa.

May 11-12, 1961. Washington, D.C. Statler Hotel, 38th Annual AIC Meeting. The Washington Chapter will be our host.

May 12, 1961. Minneapolis, Minn. (Place to be announced) Meeting of Twin City Chapter. Presentation of student medals. For information: Dr. H. L. Weisbecker, 2138 Berkeley Ave., St. Paul, Minn.

May 17, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. Gerald Gordon, E. I. du-Pont de Nemours & Co. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

May 25, 1961. New York, N. Y. Place to be announced. Presentation of the Honor Scroll of the New York Chapter. Honoree and details to be announced.

June 21, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. A. Allan Bates, Portland Cement Association. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

Charter Day Celebration

The Piedmont AIC Chapter held its annual Charter Day Banquet, Oct. 6, at the Atlanta Athletic Club, Atlanta, Georgia, preceded by a social hour through the courtesy of the Will Corporation of Georgia.

Dan L. Henry, F.A.I.C., associate director, Law & Company, Atlanta, and retiring chairman of the Chapter, presided. The invocation was given by Preston H. Williams, F.A.I.C., of the Coca-Cola Company, Atlanta. The new officers for 1960-61 were introduced. (See page 430).

Dr. Ivy M. Parker, F.A.I.C., of the Plantation Pipe Line Company, the new chairman of the Chapter, introduced the guest speaker, George Goodwin, vice president of the First National Bank of Atlanta, who forecast the future for chemists.

FOR YOUR LIBRARY

Classification of High Polymers

A Review. By R. Houwink with the collaboration of H. Bouman. International Union of Pure & Applied Chemistry. Butterworth's Scientific Publications, Butterworth & Co. Ltd. (Canada). 1960. 54 *pp.* 6¼" x 9¾". $2.25.

This review, started in 1953, was circulated in draft form to the individuals responsible for each of the 27 classification systems mentioned, and the comments were used in this final version. Four groups of people will benefit from this systematic arrangement of the high polymers covering the field of plastics, rubbers and synthetic fibers. Each of these groups, patent documentalists, librarians, manufacturers, and consumers, has somewhat different requirements, though for convenience, the first two are referred to as "librarians"; the last two as "users." To facilitate the use of this monograph by these groups, Section 4 outlines how various requirements may be covered and indicates useful tables. This is followed by critical discussion of the existing classifications and labeling systems. References and a summary end the brochure, with some interesting suggestions about international nomenclature. This is a useful and practical addition to the libraries of those in the high polymer field.

—Dr. Frederick A. Hessel, F.A.I.C.

Extractive Metallurgy

By Joseph Newton. John Wiley & Sons, Inc. viii — 532 *pp.* $9.75.

Instead of approaching his subject from the point of view of the individual metals, Prof. Newton discusses the processes of extractive metallurgy as unit processes and thus presents a unified picture of the whole field that is both logical and useful to one faced with problems to be solved. Basic principles receive major emphasis rather than details of practice that vary widely from plant to plant. The treatment is based on the second part of the author's *Introduction to Metallurgy* and is primarily intended as a test for a first course in extractive metallurgy. Included are discussions of metal crystals, equilibrium diagrams and Gibbs' phase rule, in addition to subjects conventionally covered in such a course. This valuable book contains a vast amount of information in readily available form.

—D. H. Killeffer, F.A.I.C.

Lipide Chemistry

By D. J. Hanahan with chapters by F. R. N. Gurd and I. Zabin. John Wiley & Sons. 1960. 333 *pp.* 6" x 9½". $10.00.

This desirable text, designed for beginners as well as advanced students, covers the following subjects: Isolation and purification of lipides; Phosphoglycerides; Phosphoinositides; Sphingolipides; Minor phospholipides; Simple lipides; Lipoprotein systems. The subject matter is excellently presented and there is a well selected bibliography.

—Dr. Henry Tauber, F.A.I.C.

Nutritional Evaluation of Food Processing

Edited by Robert S. Harris and Harry von Loesecke. John Wiley & Sons, Inc. 1960. 612 *pp.* 6½" x 9½". $12.00.

Processing of foods from field to table involves some loss of nutritional value, in proportion to the intensity of treatment and the carelessness in handling, with various components very sensitive. Quantitative results are extensively tabulated.

—Dr. J. A. Steffens, F.A.I.C.

Introduction to Chemical Engineering Problems

By William H. Corcoran and William N. Lacey. McGraw-Hill Publishing Co. 1960. 185 *pp.* 6" x 9". $9.50.

The authors, professors of chemical engineering at The California Institute of Technology, have prepared this book "as an introduction to chemical engineering problems to be used before the student undertakes the study of physical chemistry, industrial chemistry, and industrial stoichiometry." There are chapters on engineering calculations and measurements, material balances, energy balances, chemical equilibria, chemical kinetics, nitric and sulfuric acids, and other pertinent topics.

—R. S. Wanush

Unitized Experiments in Organic Chemistry

By R. Q. Brewster, C. A. Vanderwerf and William McEwen. D. Van Nostrand Co., Inc. 1960. 200 *pp.* 8" x 11". $5.50.

This laboratory manual is designed to prove that organic chemistry can be taught in the laboratory, if factual material and fundamental theory complement skills and techniques. Every experiment contains a series of thought-provoking questions and a recommended time allowance for each procedure.

—William M. Dunne

Handbook of Electrochemical Constants

Roger Parsons, Compiler. Academic Press, Inc. 1960. 110 *pp.* 5½" x 7½". $6.00.

A condensed tabulation of electrochemical data reactions, solutions, molten salts, Debye-Hueckel activity coefficients, nonaqueous solvents, with basic theory, useful for data not contained in the usual reference books.

—Dr. John A. Steffens, F.A.I.C.

Brimstone — The Stone that Burns

By William Haynes. D. Van Nostrand Co., Inc. 1959. 308 *pp.* 8¼" x 6". $5.95.

The first edition of *Brimstone,* published in 1942, ran to three printings, yet the author discovered, in 1955, that second hand copies were selling in Mexico for $25. This book is the result of his decision to bring the story of the Frasch Sulfur Industry up to date. New developments in Mexico, France, and Northwestern Canada made it necessary to rewrite, entirely, the last two chapters, and their length made it imperative to condense some of the early history recounted in the first edition. Details of the controls and allocations of World War I were drastically cut as being irrelevant today.

Notes and references to each chapter are given at the end of the book so that the non-scientist can easily follow this really exciting story of a major industry originated by the daring and creative thinking of one man, Herman Frasch. For those seeking additional information graphs and statistical tables are included, as well as an index.

—Dr. Frederick A. Hessel, F.A.I.C.

Chemical Books Abroad

By Dr. Rudolph Seiden, F.A.I.C.

Springer Verlag, Berlin: *Destillier- und Rektifiziertechnik,* by E. Kirschbaum; 3rd ed., 413 pp. (331 ill.); DM 48.—The latest theories of the thermic separation of liquid mixtures through distillation and partial condensation as well as the calculations and the construction of rectifying columns are discussed in this standard textbook, written by one of the leading experts of the world.

Deutscher Verlag der Wissenschaften: *Taschenbuch der Chemie,* by W. I. Perelman; 2nd ed.; 1959, 934 pp.; DM 36.—Translated from the Russian, this big pocketbook brings the physical-chemical constants of a multitude of organic and inorganic compounds, and many tables needed by chemists in laboratory, school, or industry.

Walter de Gruyter & Co., Berlin: *Polarographische Arbeitsmethoden,* by M. von Stackelberg; 1960, 478 pp. (113 ill.); DM 38.—An introduction into the methods and uses of polarography, the apparatus recommended, and theoretical considerations; contains also an extensive literature review.

Akad. Verlag Geest & Portig, Leipzig: *Kolloidchemisches Taschenbuch,* by A. Kuhn; 5th ed., 570 pp.; DM 28.—Theory and methods of colloid chemistry are reviewed; the text, written by 19 experts, is supported by 162 illustrations and 69 tables. • *Qualitative analytische Chemie,* by A. Okav; 1960, 655 pp.; DM 38.—Originally printed in the Czech language, this modern, well-organized text-and-work-book on qualitative analysis (listing 945 references) is now available in German translation. Its translation into English should be considered.

Karl F. Haug Verlag, Ulm: *Kleine homoeopathische Therapie,* by M. Kalisch; 4th ed., 373 pp.; DM 14.80—

I doubt that this book on homeopathic therapy will be of much interest in this country.

Organisation for European Economic Co-operation, Paris: *The Chemical Industry in Europe 1958-9;* 1959, 229 *pp.;* paperbound $2.50.—This survey deals with the developments and trends of the chemical industries of the 18 European member countries comprising the O.E.E.C. The text includes numerous statistical tables and graphs concerning the relative importance of the various chemical industries and chemicals, market situation, and international trade. An interesting compilation of economic facts and figures.

Professional Material Available

(*Free unless otherwise indicated*)

"Engineering Graduate Placement Survey," 1960, Engineering Manpower Commission, EJC, 29 W. 39th St., New York 18, N. Y. (25 cents)

"Careers Ahead in the Chemical Industry," illustrated brochure, 28 pp. Manufacturing Chemists' Association, Inc., 1825 Connecticut Ave., N.W., Washington 9, D.C. (15 cents. Single free copies will be sent to educators.)

"Loan Film Directory." Lists 16 mm motion pictures and 35 mm stripfilms. Request from Scientific Apparatus Makers Association, 20 North Wacker Drive, Chicago 6, Ill.

"A Survey of Employer Practices and Expectations Concerning the Safeguarding of Proprietary Rights." Engineers Joint Council, 29 West 39th St., New York 18, N. Y. (Single reprints free.)

"Research: The New Dynamo for Economic Growth," reprint of address delivered by John T. Connor, president, Merck & Co., Inc., before Wholesale Druggists' Association Inc., Sept. 19, 1960. Request from Merck & Co., Inc., Rahway, N. J.

"Review of the International Atomic Policies and Programs of the U. S." Report to the Joint Committee on Atomic Energy, Congress. Vol. 1. Oct. 1960. For sale by Superintendent of Documents, U. S. Gov. Printing Office, Washington 25, D.C. (35 cents).

"The Science Book List for Children." American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington 5, D.C. ($1.00)

Some of the scientific bulletins being prepared by the technical profession today are approaching the content and form of some of the best magazines. Three exceptionally fine examples are "Engelhard Industries Technical Bulletin," (Vol. 1, No. 1 was issued in June 1960), published by Engelhard Industries, Inc., Research & Development Division, 497 Delancy St., Newark 5, N. J., L. A. Magistrate, editor; "Research Today," issued by Lilly Research Labs., Eli Lilly & Co., Indianapolis 6, Ind., Dr. Ewald Rohrmann, editor; and "Research Laboratory Bulletin," issued by Research Information Section, General Electric Research Lab., P.O. Box 1088, Schenectady, N. Y., Walter A. Kilrain, editor.

Not Quite Legislation, but . . .

Secretary of Agriculture
Washington, D.C.

"My friend over in Tarrebonne Parish received a $1,000 check from the government this year for not raising hogs. So I am going into the not-raising hog business next year. What I want to know is, in your opinion, what is the best kind of farm not to raise hogs on and best kind of hogs not to raise. I would prefer not to raise razorbacks, but, if that is not a good breed not to raise, I will just as gladly not raise Berkshires or Durocs.

"The hardest work in this business is going to be in keeping an inventory of how many hogs I haven't raised. My friend Bordeaux is very joyful about the future of this business; he has been raising hogs for more than 20 years and the best he ever made was $400 until this year, when he got $1,000 for not raising 50 hogs. If I can get $1,000 for not raising 50 hogs, then I will get $2,000 for not raising 100 hogs.

"I plan to operate on a small scale at first, holding myself down to about 4,000 hogs, which means I will have $80,000. Now, another thing, these hogs I will not raise will not eat 100,000 bushels of corn. I understand that you also pay farmers for not raising corn, so will you pay me anything for not raising 100,000 bushels

of corn not to feed the hogs I am not raising? I want to get started as soon as possible as this seems to be a good time of year for not raising hogs."

—Octoave Broussard, Louisiana

"P.S. Can I raise 10 or 12 hogs on the side while I am in the not-raising hog business . . . just enough to get a few sides of bacon to eat?"

—From *Clover Business Letter*, Quoted from *Aquatips*

Life With Chemistry

Dr. Kurt S. Konigsbacher, F.A.I.C.

Although many people still think of chemists as fellows who stand behind glass partitions in drugstores, crushing herbs in a mortar, there are a few other aspects to the profession today which contribute to our every-day lives! One story which shows a very practical application of chemistry goes something like this:

The Ink on the Contract

IT seems there was a contract supposedly written in 1941. In due time, this contract played an important role in a court trial recently completed in Lincoln, Nebraska. When the contract was examined by a document examiner, it was found to have been written with Skrip writing fluid containing RC-35, an additive which makes writing visible under ultraviolet light even after the ink has been eradicated.

When Bob Casey, F.A.I.C., chief chemist of the W. A. Sheaffer Pen Company, was called to testify, he stated that this particular writing fluid was not introduced by the Sheaffer people until 1955. The obvious outcome: "The evidence does not sustain the contract alleged to have been made . . ."

There is a kernel of wisdom in this little story some place, and it teaches a lesson: The next time you want to forge a contract, be sure to use ink from a really old inkwell. Chances are that it will be quite serviceable, considering what a good job chemists in this field have been doing in formulating a stable product.

The American Astronautical Society will hold its 7th National Meeting in Dallas, Texas, Jan. 16-18, 1961.

Opportunities

Doris Eager, M.A.I.C.

Chemists Available

Chemical Engineer, F.A.I.C., over twelve years experience in development, project engineering and technical service. Seeks responsible position with progressive company in N. Y., N. J., Conn. area. Box 112, THE CHEMIST.

Positions Available

Chemist (Physical) Grade 12, $8,955. Plan, conduct basic and applied research, physical chemistry and physics, pertaining to biological problems, leading to development of rapid warning devices. **Chemical Engineer,** Grade GS 11, $7,560. Research problems in drying and milling programs. Evaluate methods of obtaining crystalline structures during freeze-drying process. **Chemical Engineer,** Grade GS 9, $6,435. Studies on design, construction of equipment for fermentation, concentration, drying. Apply Civilian Personnel Office, Fort Detrick, Frederick, Maryland.

Postdoctoral Resident Research Associateships in Chemistry. One year appointments open to U. S. citizens. Stipend, subject to income tax, $8,955. Request application, stating specific field, Fellowship Office of NAS-NRC, 2101 Constitution Avenue, Washington 25, D.C. Deadline for receipt of applications, Feb. 1, 1961.

Electrochemist. Electrochemical development company. Research associated with fuel cells. Ph.D. preferred, with strong background in catalysis or solid state physics. Greater Boston. Salary open. Box 121, THE CHEMIST.

Research Engineers. Plastics manufacturer, molding powders and molded articles. Extensive experience in research or production of styrene, nylon, and derivatives. Eastern Mass. Box 123, THE CHEMIST.

Paint Chemist. Research in new products, new uses for standard products, basic research in paint vehicles. B.S. 1-4 years experience. Greater Boston, Box 125, THE CHEMIST.

Physical Chemist. Established space-age organization. Physical chemistry. Man should be more academic than product minded. Boston. Box 127, THE CHEMIST.

Starting Salaries

Starting salaries for chemistry and chemical engineering graduates in 1960 averaged 7% higher than in 1959, according to *Chemical & Engineering News* (Oct. 31, 1960), which reported an ACS survey. Chemistry graduates reported starting salaries 8% higher and chemical engineers 6% higher. Holders of the B.S. degree in chemistry received an average of $475 a month; women graduates, $425 a month; male graduates $490 a month. Those with M.S. degrees received $550 per month; Ph.D. graduates, $750. Chemical engineering graduates received $520 a month; M.S. degree holders, $585 a month. Those with doctors' degrees averaged $775 a month.

The Clearwater Sun, Clearwater, Fla., featured (Sept. 29, 1960), an article entitled, "State Chemists Act to Help Education," about the Florida AIC Chapter, and mentioned the editorial in THE CHEMIST, September, 1960.

Dr. Frederick J. Gajewski, F.A.I.C., has been named technical director of Antara Chemicals Division, General Aniline & Film Corp., New York 14, N. Y. He was formerly manager—process, research and development, in the Linden, N. J. plant, where he will temporarily continue his headquarters.

Dr. Harold M. Sonnichsen, F.A.I.C., has joined the Dewey and Almy Division of W. R. Grace & Co., in Cambridge, Mass.

Dr. Maurice J. Kelley, F.A.I.C., of Nopco Chemical Co., Harrison, N. J., served as the delegate from the American Association for the Advancement of Science to the Inauguration of Theodore August Rath as president of Bloomfield College and Seminary, Oct. 3.

W. Alex Jordan, F.A.I.C., of W. Alex Jordan Associates, New York 17, N. Y., public relations firm, announces the establishment of Jordan International, a division to handle overseas programs and projects.

Dr. Ralph L. Evans, F.A.I.C., president of Evans Research & Development Corp., New York 17, N. Y., recently presented a 15-year service pin to **Dr. Eric J. Hewitt,** F.A.I.C., vice president; a 10-year service pin to **Dr. Kurt S. Konigsbacher,** F.A.I.C., development manager, and 5-year pins to **Dr. William E. Holland,** F.A.I.C., and **Miss Elizabeth Carlson,** M.A.I.C.